US CLAIMS

1. Device for protection against overcurrents in an electrical energy distribution cabinet, which receives electrical energy supplied by at least one generator and which distributes this energy to at least two loads, which comprises:

- switching means,

- means for calculating the absolute value of the difference between at least one current entering the said cabinet and at least one corresponding current leaving the said cabinet, for at least one harmonic of these currents,

- comparison means which control the opening of the switching means if this absolute value is greater than a predetermined threshold.

2. Device according to claim 1, furthermore comprising:

- means for measuring each of the different currents entering and leaving the said cabinet,

- first calculating means for at least one harmonic of each of the said currents.

3. Device according to claim 2, wherein the calculating means determine the difference between the current coming from a generator and entering the cabinet and the sum of the currents leaving this cabinet corresponding to the loads supplied by this generator, for at least one harmonic of these currents.

4. Device according to claim 2, wherein the second calculating means determine the difference between the set of currents entering the cabinet (10) and the set of currents leaving the cabinet (10), for at least one harmonic of these currents.

5. Device according to claim 2, wherein the measurement of the value of the currents as well as the different calculations are performed cyclically, with a given sampling frequency.

6. Device according to claim 5, wherein the sampling frequency is greater by a factor of 10 than the frequency of the fundamental of the current supplied by a generator.

7. Device according to claim 5, wherein the control of the switching means is only tripped if a short circuit condition is verified during a number of sampling periods greater than a threshold.

8. Device according to claim 2, wherein the current measurements are performed on each of the phases.

9. Device according to claim 2, wherein the switching means comprise at least one contactor.

10. Device according to claim 2, wherein the calculating means perform a calculation on the fundamental harmonic of each of the currents.

11. Device according to claim 2, wherein the calculating means perform a calculation on the sum of the fundamental harmonic and of several lowest-order harmonics of each of the currents.

12. Device according to claim 2, wherein the first calculating means perform a calculation on one or more harmonics of selected order chosen from among the lowest orders of each of the currents.

13. Device according to claim 1, comprising acquisition modules wherein the current is measured, and at least one digital communication bus (B) for the transmission of information between these modules (M) and the calculating means.

14. Device according to claim 13, wherein each digital communication bus is a CAN bus.

15. Device according to claim 13, wherein the acquisition modules are situated near the electrical connections.

16. Device according to claim 13, wherein an acquisition module (M) comprises in succession a low-pass filter, a sample-and-hold circuit, a quantising module, and a discrete Fourrier transform module.

17. Device according to claim 13, wherein in the calculating means, the absolute value of the difference

between the entering current(s) and the leaving current(s) is temporally filtered.

18. Use of the device according to claim 1 in the "electrical core" of an aircraft.

19. Method of protection against overcurrents in an electrical energy distribution cabinet which receives electrical energy supplied by at least one generator and which distributes this energy to at least two loads, characterized in that it comprises the following steps:

- a step of calculation of the absolute value of the difference between at least one current entering the said cabinet and at least one corresponding current leaving the said cabinet, for at least one harmonic of these currents,

-a step of comparison of this absolute value with a predetermined threshold and of control of switching means if this absolute value is greater than this threshold.

20. Method according to claim 19, furthermore comprising:

- a step of measuring each of the different currents entering and leaving the said cabinet,

- a step of calculating at least one harmonic of each of the said currents,

- a possible switching step.

21. Method according to claim 20, wherein in the calculation step, the difference is determined between the current coming from a generator and entering the cabinet, and the sum of the currents leaving this cabinet corresponding to the loads supplied by this generator, for at least one harmonic of these currents.

22. Method according to claim 20, wherein, in the calculation step, the difference is determined between the set of currents entering the cabinet and the set of currents leaving the cabinet, for at least one harmonic of these currents.

23. Method according to claim 20, wherein the measurement of the value of the currents as well as the different calculations are performed cyclically, with a given sampling frequency.